

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES
Attorney Docket No. 12770US01**

In the Application of:)
Doyle et al.)
Serial No.: 09/273,673) Examiner: Clement Graham
Filed: March 22, 1999) Group Art Unit: 3628
For: Computer Apparatus and Method) Confirmation No.: 7424
for Trading and Clearing Futures)
Contracts to Accommodate a)
Variable Sensitivity Related to)
the General Level of Interest)
Rates)
)

CERTIFICATION OF ELECTRONIC TRANSMISSION

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Christopher N. George (Reg. No. 51,728)

*/Christopher N. George/
Signature*

BRIEF ON APPEAL

MAIL STOP: APPEAL BRIEF-PATENTS
Board of Patent Appeals and Interferences
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir or Madam:

This is an appeal from a Final Office Action mailed August 23, 2007, in which claims 21-40 were finally rejected. This Appeal Brief is being submitted in conjunction with the Notice of Appeal filed on February 25, 2008. The Applicant respectfully requests that the Board of Patent Appeals and Interferences reverse the final rejection of claims

21-40 of the present application. Pursuant to 37 CFR § 1.17(c), the fee for filing this brief is \$255, to be charged to the Deposit Account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017, along with any other fees due in relation to this application.

REAL PARTY IN INTEREST
(37 C.F.R. § 41.37(c)(1)(i))

John and Martin Doyle, U.S. residents having a place of business at One Chicago, LLC, 141 W. Jackson Blvd., Suite 2208-A, Chicago, IL 60604, are the inventors of the present application and hold the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor.

RELATED APPEALS AND INTERFERENCES
(37 C.F.R. § 41.37(c)(1)(ii))

There currently are no appeals pending regarding related applications.

STATUS OF CLAIMS
(37 C.F.R. § 41.37(c)(1)(iii))

Claims 21-40 are pending in the present application. Pending claims 21-40 have been rejected and are the subject of this appeal. Specifically, claims 21-40 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wagner, U.S. Patent No. 4,903,201 (“Wagner”) in view of Shepherd, U.S. Patent No. 5,970,479 (“Shepherd”). The text of the pending claims is provided in the Claims Appendix.

STATUS OF AMENDMENTS
(37 C.F.R. § 41.37(c)(1)(iv))

There are no amendments pending in the present application. All prior amendments have been entered and are represented in pending claims 21-40 which stand rejected.

SUMMARY OF CLAIMED SUBJECT MATTER
(37 C.F.R. § 41.37(c)(1)(v))

Independent claim 21 recites the following:

21. A system for forward rate agreement futures contract trading¹, wherein a forward rate agreement futures contract comprises a convex futures contract related to a London Interbank Offered Rate (LIBOR), said system comprising:

an input device² receiving or having access to:

1) a settlement price for each of a plurality of forward rate agreement futures contracts listed by an exchange,³

2) expirations for each of the plurality of forward rate agreement futures contracts,⁴

3) an identification of a seller of each of the plurality of forward rate agreement futures contracts,⁵

4) an identification of a buyer of each of the plurality of forward rate agreement futures contracts,⁶

5) a trade price for each of the plurality of forward rate agreement futures contracts,⁷ and

6) a base tick value representing a currency value for a minimum change in a contract price⁸; and

a processor⁹ configured to:

1) calculate and save a present value factor using the settlement price of a forward rate agreement futures contract of the plurality of forward rate agreement futures contracts whose expiration is closest to the current date on which the

¹ See, e.g., present application at page 6, line 27 – page 8, line 14; page 14, lines 8-26; page 19, line 19 – line 19 – page 22, line 1; page 25, lines 7-14; and Figure 1, refs. 1 and 4.

² See, e.g., present application at page 20, lines 7-18; page 21, lines 17-23; page 22, line 2 – page 23, line 3; and Fig. 1, ref 12.

³ See, e.g., present application at page 22, lines 9-13.

⁴ See, e.g., present application at page 22, lines 19-21.

⁵ See, e.g., present application at page 22, lines 25-27.

⁶ See, e.g., present application at page 22, lines 22-24.

⁷ See, e.g., present application at page 22, lines 28-29.

⁸ See, e.g., present application at page 22, lines 14-18.

⁹ See, e.g., present application at page 16, line 19 – page 17, line 13; page 19, line 20 – page 20, line 15; page 24, line 14 – page 25, line 6; and Fig. 1, refs. 2, 4 and 6.

present value factor is calculated, the processor calculating and saving a present value factor for each of the remaining plurality of forward rate agreement futures contracts based on the previous present value factor calculation and the settlement price of the forward rate agreement futures contract whose expiration is next closest to the current date on which the present value factor is calculated,¹⁰

2) determine an actual tick value for each of the plurality of forward rate agreement futures contracts based on the present value factor for the forward rate agreement futures contract and the base tick value,¹¹

3) generate a settlement amount for each of the plurality of forward rate agreement futures contracts using:¹²

a) a number of contracts net bought or sold by an entity by the end of the previous day,¹³

b) a number of contracts bought or sold by the entity by the end of the current day,¹⁴

c) a price at which the entity bought or sold during the current day,¹⁵

d) a settlement price for each contract for the previous day,¹⁶

e) a settlement price for each contract for the current day,¹⁷ and

f) the actual tick value for the current day for each forward rate agreement futures contract,¹⁸

the settlement amount representing, for each forward rate agreement futures contract, an amount paid by an entity that lost money to the exchange or paid by the exchange to an entity that made money on the current day,¹⁹ and

¹⁰ See, e.g., present application at page 14, line 27 – page 15, line 21; page 23, lines 4-7; and Fig. 2, ref. 50.

¹¹ See, e.g., present application at page 15, line 22 – page 16, line 3; page 23, lines 8-12; and Fig. 2, ref. 52.

¹² See, e.g., present application at page 16, lines 4-18; page 23, lines 13-19; and Fig. 2, ref. 54.

¹³ See, e.g., present application at page 16, lines 12-13.

¹⁴ See, e.g., present application at page 16, lines 13-14.

¹⁵ See, e.g., present application at page 16, lines 14-15.

¹⁶ See, e.g., present application at page 14, line 27 – page 15, line 5; and page 16, lines 15-16.

¹⁷ See, e.g., present application at page 16, lines 16-17.

¹⁸ See, e.g., present application at page 16, lines 17-18; page 23, lines 9-12 and 23; page 24, line 1; and Fig. 2, refs. 52 and 54.

¹⁹ See, e.g., present application at page 16, lines 6-10.

4) generate payment instructions for at least one of a buyer's bank and a seller's bank based on the settlement amount for each of the plurality of forward rate agreement futures contracts.²⁰

Independent claim 26 recites the following:

26. A method for convex futures contract trading,²¹ the convex futures contract price related to an interest rate, wherein a plurality of convex futures contracts are listed on an exchange and each of the plurality of convex futures contracts has a related settlement price,²² expiration,²³ and trade price,²⁴ said method comprising:

calculating and saving a first present value factor using the settlement price of a first convex futures contract of the plurality of convex futures contracts whose expiration is closest to the current date on which the first present value factor is calculated;²⁵

calculating and saving a present value factor for each of the remaining plurality of convex futures contracts based on the previous present value factor calculation and the settlement price of the convex futures contract whose expiration is next closest to the current date on which the present value factor is calculated;²⁶

determining an actual tick value for each of the plurality of convex futures contracts based on the present value factor for the convex futures contract and a base tick value representing a currency value for a minimum change in a contract price;²⁷

generating a settlement amount for each of the plurality of convex futures contracts using;²⁸

1) a number of contracts net bought or sold by an entity by the end of the previous day;²⁹

²⁰ See, e.g., present application at page 24, lines 4-13; and Fig. 2, refs. 56 and 58.

²¹ See, e.g., present application at page 6, line 27 – page 8, line 14; page 14, lines 8-26; page 19, line 19 – line 19 – page 22, line 1; page 25, lines 7-14; and Figure 1, refs. 1 and 4. See also, generally, for the method page 25, line 15 – page 26, line 12 and page 28, line 7 – page 29, line 4.

²² See, e.g., present application at page 22, lines 9-13.

²³ See, e.g., present application at page 22, lines 19-21.

²⁴ See, e.g., present application at page 22, lines 28-29.

²⁵ See, e.g., present application at page 14, line 27 – page 15, line 21; page 23, lines 4-7; and Fig. 2, ref. 50.

²⁶ See, e.g., present application at page 14, line 27 – page 15, line 21; page 23, lines 4-7; and Fig. 2, ref. 50.

²⁷ See, e.g., present application at page 15, line 22 – page 16, line 3; page 23, lines 8-12; and Fig. 2, ref. 52.

²⁸ See, e.g., present application at page 16, lines 4-18; page 23, lines 13-19; and Fig. 2, ref. 54.

²⁹ See, e.g., present application at page 16, lines 12-13.

2) a number of contracts bought or sold by the entity by the end of the current day;³⁰

3) a price at which the entity bought or sold during the current day,³¹

4) a settlement price for each contract for the previous day,³²

5) a settlement price for each contract for the current day,³³ and

6) the actual tick value for the current day for each convex futures contract,³⁴

the settlement amount representing, for each convex futures contract, an amount paid by an entity that lost money to the exchange or paid by the exchange to an entity that made money on the current day;³⁵ and

generating payment instructions for at least one of a buyer's bank and a seller's bank based on the settlement amount for each of the plurality of convex futures contracts.³⁶

Independent claim 40 recites the following:

40. A method for clearing convex futures contracts³⁷ traded on an exchange by one or more trading firms, a price of the convex futures contracts related to an interest rate, said method comprising:

multiplying a trade price for a convex futures contract by a discount factor for an appropriate date to determine a settlement amount due by or to a trading firm,³⁸ the discount factor modifying the trade price based on a base tick value adjusted by a

³⁰ See, e.g., present application at page 16, lines 13-14.

³¹ See, e.g., present application at page 16, lines 14-15.

³² See, e.g., present application at page 14, line 27 – page 15, line 5; and page 16, lines 15-16.

³³ See, e.g., present application at page 16, lines 16-17.

³⁴ See, e.g., present application at page 16, lines 17-18; page 23, lines 9-12 and 23; page 24, line 1; and Fig. 2, refs. 52 and 54.

³⁵ See, e.g., present application at page 16, lines 6-10.

³⁶ See, e.g., present application at page 24, lines 4-13; and Fig. 2, refs. 56 and 58.

³⁷ See, e.g., present application at page 6, line 27 – page 8, line 14; page 14, lines 8-26; page 19, line 19 – line 19 – page 22, line 1; page 25, lines 7-14; and Figure 1, refs. 1 and 4. *See also*, generally, for the method page 25, line 15 – page 26, line 12 and page 28, line 7 – page 29, line 4.

³⁸ See, e.g., present application at page 16, lines 4-18; page 23, lines 13-19; and Fig. 2, ref. 54.

representative closing price of last trading for the convex futures contract for the appropriate date;³⁹

notifying the trading firm of a trade confirmation for the convex futures contract, the trade price for the convex futures contract, the discount factor for the convex futures contract, open positions for the convex futures contract, and the settlement amount due to or from the trading firm;⁴⁰ and

triggering a computer-assisted transfer of funds to or from an account associated with the trading firm.⁴¹

Forward Rate Agreement (FRA) or convex futures contracts are new constructs created and claimed for hedging by banks. Such contracts are complex and involve a complex computer system to implement. By applying a present value factor to a tick value (a dollar value of a minimum change in the price of the futures contract) convexity is added to the futures contract.

A FRA futures contract adds a feature of reducing cash flows by a discount factor or present value factor. The payment that would be made by the futures clearing entity in would be multiplied by the present value factor appropriate for the date of payment and therefore be reduced.

Certain embodiments provide support for a futures contract with a tick value that varies with general level of interest rates. A settlement price of a contract with an expiration closest to the current date is used to determine the first present value factor (PVF1). Multiplying the PVF1 by a base tick value produces an actual tick value. Then, a settlement price may be calculated for the current day from the actual tick value for the current day, a number of contracts bought or sold by the end of the previous day, a number of contracts bought or sold during the current day, a price at which the entity bought or sold during the current day, a settlement price for each contract from the previous day, and a settlement price for each contract from the current day.

³⁹ See, e.g., present application at page 15, line 22 – page 16, line 3; page 23, lines 8-12; and Fig. 2, ref. 52.

⁴⁰ See, e.g., present application at page 16, lines 6-10.

⁴¹ See, e.g., present application at page 24, lines 4-13; and Fig. 2, refs. 56 and 58.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL
(37 C.F.R. § 41.37(c)(1)(vi))

I. Are claims 21-40 unpatentable under 35 U.S.C. § 103(a) over Wagner in view of Shepherd?

ARGUMENT
(37 C.F.R. § 41.37(c)(1)(vii))

The Examiner has maintained the rejections of claims 21-40. As shown above, Wagner and Shepherd form the basis for all the claim rejections. Claims 21-40 should be in condition for allowance at least because the cited references, whether taken alone or in combination with one another, do not describe, teach or suggest the present value factor calculation, the actual tick value determination, or the settlement amount generation recited in the presenting claims.

I. Claims 21-40 are patentable under 35 U.S.C. § 103(a) over Wagner in view of Shepherd.

In the Office Action of August 23, 2007,⁴² the Examiner rejected claims 21-40 under 35 U.S.C. 103(a) as being unpatentable over Wagner in view of Shepherd.⁴³ 35 U.S.C. § 103(a) states as follows:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.⁴⁴

There are “three basic criteria” for a *prima facie* case of obviousness.”

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of

⁴² Attached as Evidence Appendix B.

⁴³ U.S. Patent No. 4,903,201 by Wagner (“Wagner”) is attached as Evidence Appendix C. U.S. Patent No. 4,903,201 by Shepherd (“Shepherd”) is attached as Evidence Appendix D.

⁴⁴ 35 U.S.C. § 103(a).

ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.⁴⁵

The Final Office Action of August 23, 2007 violates the last of the three basic legal criteria set out above for establishing a *prima facie* case, which is: "all the claim limitations must be taught or suggested by the prior art."⁴⁶ If a *prima facie* case of obviousness is not established, the Applicant is under no obligation to submit evidence of nonobviousness.

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.⁴⁷

In ascertaining the differences between the prior art and the claims of a pending application under 35 U.S.C. § 103(a), the analysis "is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious."⁴⁸ Moreover, "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art."⁴⁹ As described in detail below, none of the references cited by the Examiner teach or suggest all limitations of the appealed claims. Even in view of the recent *KSR* decision, several elements recited in claims 21-40 are simply lacking from the cited references, and no motivation to combine would fill those gaps.

A critical step in analyzing the patentability of claims pursuant to § 103(a) is casting the mind back to the time of invention, to properly consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted

⁴⁵ MPEP § 2142 (citing *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991)).

⁴⁶ MPEP § 2143.03 (citing *In re Royka*, 490 F.2d 981 (C.C.P.A. 1974)) (emphasis added).

⁴⁷ *Id.*

⁴⁸ MPEP § 2141.02 (citing *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530 (Fed. Cir. 1983)).

⁴⁹ MPEP § 2143.03 (quoting *In re Wilson*, 424 F.2d 1382, 1385 (C.C.P.A. 1970)).

wisdom in the field.⁵⁰ The proper obviousness analysis under 35 U.S.C. § 103(a) must occur at the time the invention was made and avoid the impermissible use of hindsight:

To reach a proper determination under 35 U.S.C. 103, the examiner must step backward in time and into the shoes worn by the hypothetical “person of ordinary skill in the art” when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention would have been obvious at that time to that person. . . . The tendency to resort to “hindsight” based upon applicant’s disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.⁵¹

In applying a reference under 35 U.S.C. § 103(a), the “reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention.”⁵² In other words, the cited prior art as a whole must be considered, taking into account the negative teachings that would lead a person of ordinary skill away from the patented invention, as well as the teachings unfavorable to patentability.⁵³ The Federal Circuit held in the *Dow* case:

In determining whether such a suggestion can fairly be gleaned from the prior art, the full field of the invention must be considered; for the person of ordinary skill is charged with knowledge of the entire body of technological literature, including that which might lead away from the claimed invention. The Commissioner argues that since the PTO is no longer relying on Farmer or the Bacon and Farmer article, the applicant is creating a “straw man”. It is indeed pertinent that these references teach against the present invention. Evidence that supports, rather than negates, patentability must be fairly considered.⁵⁴

⁵⁰ *In re Kotzab*, 217 F.3d 1365, 1369 (Fed. Cir. 2000); *see also In re Dembiczkak*, 175 F.3d 994, 999 (Fed. Cir. 1999); *Grain Processing Corp. v. Am. Maize-Props. Co.*, 840 F.2d 902, 907 (Fed. Cir. 1988) (cautioning against employing hindsight by using the appellant’s disclosure as a blueprint to reconstruct the claimed invention from the isolated teachings of the prior art).

⁵¹ MPEP § 2142.

⁵² MPEP § 2141.02 (citing *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983)).

⁵³ *In re Dow Chemical Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988).

⁵⁴ *Id.* (emphasis added).

Moreover, the law gives significant weight to the fact that the only prior art on point teaches away from limitations of a pending claim.⁵⁵

Finally, as a dependent claim includes all the limitations of the base claim(s) from which it depends, “[i]f an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious.”⁵⁶ In other words, if an independent claim is nonobvious, then all claims depending on the independent claim are also nonobvious.

The Applicant now presents arguments in favor of the patentability of pending claims 21-40.

A. Procedural History

To place the appeal in context, the Applicant provides a brief history of the prosecution of the present application. Claims 1-18, and 20 were been previously allowed by the Examiner in an Office Action mailed December 2, 2002. Claim 19 had been rejected, so claim 19 was cancelled by the Applicant to proceed with allowance. Then, in 2003, the application was selected for a second tier review. In spite of numerous status inquiries and phone calls, a next office action was not issued until July 8, 2005, rejecting claims 1-18 and 20 in view of the previously discussed references. A Pre-Appeal Request for Review was filed on April 11, 2006, and the result of that review was a re-opening of prosecution on May 18, 2006. After further attempts to amend and clarify the scope of the claims versus the cited art with the Examiner, the Applicant now files this appeal.

B. The Wagner Patent

The text of independent claim 21 is found in the claims appendix (attached) and is also recited above. Wagner is and has been the foundational reference relied upon by the Examiner in rejecting claims throughout the examination of the present application. Wagner generally relates to a computerized open outcry exchange system for transacting sales of a particular futures commodity contract by members of a futures trading exchange wherein bids to purchase or offers to sell the particular commodity contract are

⁵⁵ See *Ecocolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1374 (Fed. Cir. 2000) (“The absence of a convincing discussion of the specific sources of the motivation to combine the prior art references, particularly in light of the strength of prior art teaching away from the use of the Houghton process, is a critical omission in the district court’s obviousness analysis, which mainly discusses the ways that the multiple prior art references can be combined to read on the claimed invention.”).

⁵⁶ MPEP § 2143.03 at 133 (citing *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988)).

made by the members through remote terminals and the exchange computer automatically matches offers and bids to complete the transaction.⁵⁷ As the Examiner points out, Wagner fails to teach key elements of the claim relating to determination of the settlement price based on a base tick value, an expiration time, computation of a present value factor from the settlement price and determining an actual ticket value. Wagner also does not teach or suggest specifying an amount of money a clearing entity must transfer between the buyer and the seller for clearing the convex futures contract by applying the actual tick value to a difference between the trade price data and the settlement price. As stated by the Examiner:

Wagner fail to explicitly teach calculate and save a present value factor using the settlement price of a forward rate agreement futures contract of the plurality of forward rate agreement futures contracts whose expiration is closest to the current date on which the present value factor is calculated, the processor calculating and saving a present value factor for each of the remaining plurality of forward rate agreement futures contracts based on the previous present value factor calculation and the settlement price of the forward rate agreement futures contract whose expiration is next closest to the current date on which the present value factor is calculated.⁵⁸

Thus, Wagner teaches a computer system for use in trading to replace the shouting of traders on the trading floor but teaches nothing else with respect to the presently claimed invention. In Wagner, bids are entered at remote terminals by users, and a simple comparison and match is conducted on a first come, first served basis to identify trades, akin to the shouting of offers to sell or buy on a traditional trading floor.⁵⁹ By facilitating this shouting exchange electronically, an accurate record of trades can be maintained.⁶⁰ Wagner takes a traditional trading floor exchange between personnel and makes it electronically recordable for later reporting purposes (e.g., can we analyze patterns of trading, volume of trading at a particular time or location, etc.). Wagner makes no mention of a present value factor calculation, a base tick value, or an actual tick value based on the present value factor and the base tick value. Wagner fails to disclose

⁵⁷ See, e.g., Wagner at Abstract; col. 1, lines 5-13 and 52-62; col. 3, lines 33-38; and col. 20, line 54 – col. 21, line 6.

⁵⁸ Office Action mailed August 23, 2007, at page 3.

⁵⁹ See, e.g., Wagner at col. 1, lines 5-24 and 52-63; col. 3, lines 59-66; and col. 5, lines 31-61.

⁶⁰ See, e.g., Wagner at col. 3, lines 4-11 and 33-38; and col. 20, line 43 – col. 21, line 6.

generating a settlement amount for each of a plurality of forward rate agreement futures contracts based on this and other information.

C. The Shepherd Patent

The Examiner relies upon the Shepherd patent to support the proposition that the prior art discloses automatically calculating a contract bid price so as to render obvious the calculating and saving of a present value factor to determine a settlement price for a forward rate futures contract.⁶¹

Shepherd related to managing risk relating to specified, yet unknown, future events.⁶² In Shepherd, parties may “reduce their exposure to specified risks by constructing compensatory claim contract orders on yet-to-be-identified counter-parties, being contingent upon the occurrence of the specified future events.”⁶³ The parties submit orders which are matched and processed through to their maturity.⁶⁴ Thus, Shepherd allows different parties to define their views as to a likely outcome of some future event.⁶⁵ Based on a match between these expectations, a contract may be formed.⁶⁶ In so doing, potential counter-parties to a contract can use the “opportunity to exploit differing view of future outcomes to their advantage, either for some gain or, again, as a form of risk management.”⁶⁷ Clearly, systems and methods allowing parties and counter-parties to gamble and guess about future events and outcomes is distinct from the determination of a settlement price for each of a plurality of forward rate futures contracts using a present value factor using certain known information as recited in the presently pending claims.

In one example, Shepherd discusses a contract to manage risk associated with faults in microprocessors.⁶⁸ One party seeking to avoid the adverse consequences of faulty microprocessors can contract with the manufacturer of those microprocessors based on their view of the future incidence of faults in the microprocessors they

⁶¹ Office Action mailed August 23, 2007, at pages 3-4.

⁶² See, e.g., Shepherd at Abstract; and col. 1, lines 6-10.

⁶³ See, e.g., Shepherd at col. 3, lines 29-35.

⁶⁴ See, e.g., Shepherd at col. 3, lines 36-38.

⁶⁵ See, e.g., Shepherd at col. 3, lines 48-52.

⁶⁶ See, e.g., Shepherd at col. 3, lines 52-54.

⁶⁷ See, e.g., Shepherd at col. 3, lines 54-58

⁶⁸ See, e.g., Shepherd at col. 11, lines 15-26.

produce.⁶⁹ The contract offering includes a contingent entitlement to a specified quantity of replacement and additional microprocessors based on a defined degree of fault in the shipped microprocessors at the contract maturity date.⁷⁰ The Contract Bid Price for such a contract is then calculated using the contingent entitlement amounts (i.e., the feasible product definition value range) multiplied by the prices of each of those components (i.e., the number of components times the price per component) to determine a payment amount.⁷¹ The present day value of such an amount is calculated using a specified discount rate, and a flat commission is added to that amount to determine the contract bid price.⁷² Thus, a contract bid price is determined using a number of units, a price per unit, and a provided discount rate. Shepherd merely says that the discount rate is provided and does not discuss what provides the discount rate or how it is generated. The discount rate is defined by Shepherd as the “rate used to determine the present value of a potential counterparty’s expected future entitlements.”⁷³

The present value in Shepherd is different from the present value factor calculation as presently claimed. Additionally, Shepherd makes no mention of a base tick value or an actual tick value calculation based on the base tick value and the present value factor. Shepherd fails to disclose generating a settlement amount for each of a plurality of forward rate agreement futures contracts based on this and other information.

D. The cited art fails to disclose systems or methods to “calculate and save a present value factor using the settlement price of a forward rate agreement futures contract of the plurality of forward rate agreement futures contracts whose expiration is closest to the current date on which the present value factor is calculated, the processor calculating and saving a present value factor for each of the remaining plurality of forward rate agreement futures contracts based on the previous present value factor calculation and the settlement price of the forward rate agreement futures contract whose expiration is next closest to the current date on which the present value factor is calculated”.

Claim 21 recites in part to “calculate and save a present value factor using the settlement price of a forward rate agreement futures contract of the plurality of forward

⁶⁹ See, e.g., Shepherd at col. 11, lines 18-26.

⁷⁰ See, e.g., Shepherd at col. 11, lines 27-41.

⁷¹ See, e.g., Shepherd at col. 12, lines 39-48.

⁷² See, e.g., Shepherd at col. 12, lines 52-58.

⁷³ See, e.g., Shepherd at col. 30, lines 28-30.

rate agreement futures contracts whose expiration is closest to the current date on which the present value factor is calculated, the processor calculating and saving a present value factor for each of the remaining plurality of forward rate agreement futures contracts based on the previous present value factor calculation and the settlement price of the forward rate agreement futures contract whose expiration is next closest to the current date on which the present value factor is calculated". Independent claim 26 recites a similar limitation. The Office Action cites Wagner and/or Shepherd as disclosing these limitations.

As agreed upon by the Examiner, Wagner fails to disclose this limitation. Further, while Shepherd mentions applying a discount rate to the total number of desired units times the price per unit, Shepherd fails to disclose the present value factor calculated as claimed. Namely, the claimed present value factor is calculated the settlement price of a forward rate agreement future contract of the plurality of forward rate agreement futures contracts whose expiration is closest to the current date on which the present value factor is calculated. Then, the processor calculates and saves a present value factor for each of the remaining plurality of forward rate agreement futures contracts based on (1) the previous present value factor calculation and (2) the settlement price of a forward rate agreement futures contract of the plurality of forward rate agreement futures contracts whose expiration is next closest to the current date on which the present value factor is calculated.

Thus, the processor calculates a present value for each of the plurality of FRA futures contracts, and then calculates feed off of information from the previous value calculation stretching back in time from the current date. As shown above, there is nothing in the cited portions or the remainder of either Wagner or Shepherd that describes, teaches, suggests, or motivates this limitation as recited in independent claims 21 and 26. Similarly, independent claim 40 recites computing a discount factor for an appropriate date based on a representative closing price of last trading for the convex futures contract for the appropriate date.

Thus, the Office Action has failed to establish a *prima facie* case of obviousness with respect to any of claims 21-40.

E. The cited art fails to disclose systems or methods to “determine an actual tick value for each of the plurality of forward rate agreement futures contracts based on the present value factor for the forward rate agreement futures contract and the base tick value”.

Claim 21 recites in part to “determine an actual tick value for each of the plurality of forward rate agreement futures contracts based on the present value factor for the forward rate agreement futures contract and the base tick value”. Independent claim 26 recites a similar limitation. The Office Action cites Wagner and/or Shepherd as disclosing these limitations.

Neither Wagner nor Shepherd makes any mention of any sort of tick value. Further, neither Wagner nor Shepherd discloses computation of an actual tick value using a base tick value and the present value factor. Such an actual tick value computation is described and claimed in independent claims 21 and 26. Additionally, in independent claim 40, a discount factor is determined based on a base tick value adjusted by a representative closing price of last trading for the convex futures contract for the appropriate date. Such a discount factor is not found in the cited art.

As shown above, there is nothing in the cited portions or the remainder of either Wagner or Shepherd that describes, teaches, suggests, or motivates this limitation as recited in the independent claims. Thus, the Office Action has failed to establish a *prima facie* case of obviousness with respect to any of claims 21-40.

F. The cited art fails to disclose systems or methods to “generate a settlement amount for each of the plurality of forward rate agreement futures contracts using: a) a number of contracts net bought or sold by an entity by the end of the previous day, b) a number of contracts bought or sold by the entity by the end of the current day, c) a price at which the entity bought or sold during the current day, d) a settlement price for each contract for the previous day, e) a settlement price for each contract for the current day, and f) the actual tick value for the current day for each forward rate agreement futures contract”.

Claim 21 recites in part to “generate a settlement amount for each of the plurality of forward rate agreement futures contracts using: a) a number of contracts net bought or sold by an entity by the end of the previous day, b) a number of contracts bought or sold by the entity by the end of the current day, c) a price at which the entity bought or sold during the current day, d) a settlement price for each contract for the previous day, e) a

settlement price for each contract for the current day, and f) the actual tick value for the current day for each forward rate agreement futures contract". Independent claim 26 recites a similar limitation. Independent claim 40 recites multiplying a trade price for a convex futures contract by the calculated discount factor for the appropriate date to determine a settlement amount due by or to a trading firm. The claims then recite notifying or generating payment instructions. The Office Action cites Wagner and/or Shepherd as disclosing these limitations.

Wagner records time and trade information data for auditing purposes, not to determine a settlement price as recited in the pending claims. Additionally, any price modification in Wagner is in the form of a manual entry by a user via cursor and terminal rather than computed by a system based on data as recited herein. The settlement amount of Wagner is a simple offer and accept method facilitated via an electronic exchange rather than shouting or open outcry on a trading floor. Settlement in Shepherd is based on acceptance of the bid price computed as described above based on a number of units, unit price, and specified discount rate.

As shown above, there is nothing in the cited portions or the remainder of either Wagner or Shepherd that describes, teaches, suggests, or motivates this limitation as recited in the independent claims. Thus, the Office Action has failed to establish a *prima facie* case of obviousness with respect to any of claims 21-40.

II. The Proposed Combination Of Wagner And Shepherd Does Not Render Claims 21-40 Unpatentable

The Applicants respectfully submit that the Office Action fails to establish a *prima facie* case of obviousness with respect to claims 21-40 for at least the reasons discussed above in Section I. Indeed, the proposed combination of Wagner and Shepherd does not render these claims unpatentable for at least the reasons discussed above. Furthermore, dependent claims 22-25 and 27-40 additional limitations and particular formulas for the calculation of present value factors (claims 23 and 28), actual tick values (claims 24 and 29), and settlement amounts (claims 25 and 30). Dependent claims 31-39 further recite various pricing and options for convex futures contracts that are not found in the cited art.

III. Conclusion

For at least the foregoing reasons, the Applicant respectfully submits that claims 21-40 are distinguishable over the prior art of record. Therefore, the Board is respectfully requested to reverse the rejections of pending claims 21-40 and indicate allowance of those claims.

IV. Payment of Fees

The Commissioner is authorized to charge any necessary fees, including the \$255 fee for this Appeal Brief, or credit overpayment to Deposit Account 13-0017.

Respectfully submitted,

Dated: April 25, 2008

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CLAIMS APPENDIX

(37 C.F.R. § 41.37(c)(1)(viii))

The following claims are involved in this appeal:

- 1-20. (Canceled).
21. A system for forward rate agreement futures contract trading, wherein a forward rate agreement futures contract comprises a convex futures contract related to a London Interbank Offered Rate (LIBOR), said system comprising:
 - an input device receiving or having access to:
 - 1) a settlement price for each of a plurality of forward rate agreement futures contracts listed by an exchange,
 - 2) expirations for each of the plurality of forward rate agreement futures contracts,
 - 3) an identification of a seller of each of the plurality of forward rate agreement futures contracts,
 - 4) an identification of a buyer of each of the plurality of forward rate agreement futures contracts,
 - 5) a trade price for each of the plurality of forward rate agreement futures contracts, and
 - 6) a base tick value representing a currency value for a minimum change in a contract price; and
 - a processor configured to:
 - 1) calculate and save a present value factor using the settlement price of a forward rate agreement futures contract of the plurality of forward rate agreement

futures contracts whose expiration is closest to the current date on which the present value factor is calculated, the processor calculating and saving a present value factor for each of the remaining plurality of forward rate agreement futures contracts based on the previous present value factor calculation and the settlement price of the forward rate agreement futures contract whose expiration is next closest to the current date on which the present value factor is calculated,

2) determine an actual tick value for each of the plurality of forward rate agreement futures contracts based on the present value factor for the forward rate agreement futures contract and the base tick value,

3) generate a settlement amount for each of the plurality of forward rate agreement futures contracts using:

a) a number of contracts net bought or sold by an entity by the end of the previous day,

b) a number of contracts bought or sold by the entity by the end of the current day,

c) a price at which the entity bought or sold during the current day,

d) a settlement price for each contract for the previous day,

e) a settlement price for each contract for the current day, and

f) the actual tick value for the current day for each forward rate agreement futures contract,

the settlement amount representing, for each forward rate agreement futures contract, an amount paid by an entity that lost money to the exchange or paid by the exchange to an entity that made money on the current day, and

4) generate payment instructions for at least one of a buyer's bank and a seller's bank based on the settlement amount for each of the plurality of forward rate agreement futures contracts.

22. The system of claim 21, further comprising an output device generating documentation of a funds transfer and confirmation of trade.

23. The system of claim 21, wherein the present value factor (PVF) is determined using $PVF = \frac{1}{[1 + R_0(D_0/360)] \times [1 + F_1(D_1/360)] \times \dots \times [1 + F_n(D_n/360)]}$, wherein R_0 represents a spot LIBOR for a first futures contract expiration, D_0 represents a number of days from spot to the first futures contract expiration, D_n represents a number of days from spot to a last listed futures contract, F_1 represents a forward rate implied by the first futures contract, and F_n represents a forward rate implied by the last listed futures contract.

24. The system of claim 21, wherein the actual tick value is determined by multiplying the base tick value by the present value factor.

25. The system of claim 21, wherein the settlement amount for a futures contract buyer is determined using $B = (P_s - P_t) \times ATV \times 100$, wherein B represents a settlement amount due to or from a buyer for a futures contract, P_s represents the settlement price for the futures contract, P_t represents the trade price for the futures contract, and ATV represents the actual tick value for the futures contract, and wherein

the settlement amount for a futures contract seller is determined using $S = (P_t - P_s) \times ATV \times 100$, wherein S represents a settlement amount due to or from a seller for a futures contract, P_s represents the settlement price for the futures contract, P_t represents the trade price for the futures contract, and ATV represents the actual tick value for the futures contract.

26. A method for convex futures contract trading, the convex futures contract price related to an interest rate, wherein a plurality of convex futures contracts are listed on an exchange and each of the plurality of convex futures contracts has a related settlement price, expiration, and trade price, said method comprising:

calculating and saving a first present value factor using the settlement price of a first convex futures contract of the plurality of convex futures contracts whose expiration is closest to the current date on which the first present value factor is calculated;

calculating and saving a present value factor for each of the remaining plurality of convex futures contracts based on the previous present value factor calculation and the settlement price of the convex futures contract whose expiration is next closest to the current date on which the present value factor is calculated;

determining an actual tick value for each of the plurality of convex futures contracts based on the present value factor for the convex futures contract and a base tick value representing a currency value for a minimum change in a contract price;

generating a settlement amount for each of the plurality of convex futures contracts using:

- 1) a number of contracts net bought or sold by an entity by the end of the previous day,
- 2) a number of contracts bought or sold by the entity by the end of the current day,
- 3) a price at which the entity bought or sold during the current day,
- 4) a settlement price for each contract for the previous day,
- 5) a settlement price for each contract for the current day, and
- 6) the actual tick value for the current day for each convex futures contract,

the settlement amount representing, for each convex futures contract, an amount paid by an entity that lost money to the exchange or paid by the exchange to an entity that made money on the current day; and

generating payment instructions for at least one of a buyer's bank and a seller's bank based on the settlement amount for each of the plurality of convex futures contracts.

27. The method of claim 26, further comprising generating documentation of a funds transfer and confirmation of trade.

28. The method of claim 26, wherein the present value factor (PVF) is determined using $PVF = \frac{1}{[1 + R_0(D_0/360)] \times [1 + F_1(D_1/360)] \times \dots \times [1 + F_n(D_n/360)]}$,

wherein R_0 represents a spot LIBOR for a first futures contract expiration, D_0 represents a number of days from spot to the first futures contract expiration, D_n represents a number

of days from spot to a last listed futures contract, F_1 represents a forward rate implied by the first futures contract, and F_n represents a forward rate implied by the last listed futures contract.

29. The method of claim 26, wherein the actual tick value is determined by multiplying the base tick value by the present value factor.

30. The method of claim 26, wherein the settlement amount for a futures contract buyer is determined using $B = (P_s - P_t) \times ATV \times 100$, wherein B represents a settlement amount due to or from a buyer for a futures contract, P_s represents the settlement price for the futures contract, P_t represents the trade price for the futures contract, and ATV represents the actual tick value for the futures contract, and wherein the settlement amount for a futures contract seller is determined using $S = (P_t - P_s) \times ATV \times 100$, wherein S represents a settlement amount due to or from a seller for a futures contract, P_s represents the settlement price for the futures contract, P_t represents the trade price for the futures contract, and ATV represents the actual tick value for the futures contract.

31. The method of claim 26, further comprising:
generating a cumulative price quote for a group including a plurality of convex futures contract; and
displaying the cumulative price quote on the display device to convey information for use in trading the group.

32. The method of claim 26, further comprising:
generating a price for a floor option on a convex futures contract; and
displaying the price for the floor option on the display device to convey
information for use in trading the floor option.

33. The method of claim 32, wherein the step of generating a price includes
accounting for a limit, the limit from the group consisting of a cap, a floor, or both, in
generating the price.

34. The method of claim 26, further comprising using data representing a
convex futures contract in computing a price for an Over-The-Counter option.

35. The method of claim 34, wherein the forming an interest rate swap
including the convex futures contract includes computing interest payments for the
interest rate swap.

36. The method of claim 26, further comprising computing a zero coupon
libor curve in real time and applying the zero coupon libor curve to a portfolio of interest
rate derivatives to create forward rates, expected cash flows, and present value of the case
flows for risk management manipulation of the portfolio.

37. The method of claim 36, further comprising calculating an exposure indicia of movement in the curve.

38. The method of claim 26, further comprising publishing daily quotes of the present value factors for each of the plurality of convex futures contracts to provide information for use in trading the convex futures contracts.

39. The method of claim 26, further comprising conveying present value factor data to a plurality of vendor or broker computers on the exchange for use in trading one or more of the plurality of convex futures contracts.

40. A method for clearing convex futures contracts traded on an exchange by one or more trading firms, a price of the convex futures contracts related to an interest rate, said method comprising:

multiplying a trade price for a convex futures contract by a discount factor for an appropriate date to determine a settlement amount due by or to a trading firm, the discount factor modifying the trade price based on a base tick value adjusted by a representative closing price of last trading for the convex futures contract for the appropriate date;

notifying the trading firm of a trade confirmation for the convex futures contract, the trade price for the convex futures contract, the discount factor for the convex futures contract, open positions for the convex futures contract, and the settlement amount due to or from the trading firm; and

triggering a computer-assisted transfer of funds to or from an account associated with the trading firm.

EVIDENCE APPENDIX
(37 C.F.R. § 41.37(c)(1)(ix))

The following evidence is attached to this appeal brief as an evidence appendix:

1. Evidence Appendix A – Specification and Figures of Application filed on March 22, 1999.
2. Evidence Appendix B - Office Action mailed on August 23, 2007.
3. Evidence Appendix C - U.S. Patent No. 4,903,201 by Wagner (“Wagner”).
4. Evidence Appendix D - U.S. Patent No. 5,970,479 by Shepherd (“Shepherd”).

RELATED PROCEEDINGS APPENDIX

(37 C.F.R. § 41.37(c)(1)(x))

Not Applicable.